

Notice of Allowability

Application No.

08/994,758

Examiner

Alan A. Mathews

Applicant(s)

NISHI, KENJI

Art Unit

2851

SM

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to communication filed 6-27-2003 and 10-7-2003.
2. ☒ The allowed claim(s) is/are 1-9, 14-39, 41-43, 45, 49-55, 68-70, 72-74, 76, 80-84, 96-99, 101-103, 105, 109-115, 128-142 and 189.
3. ☒ The drawings filed on 19 December 1997 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 08/377,504.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 - (a) ☐ The translation of the foreign language provisional application has been received.
6. ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No. _____.
 - (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
 - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet.

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1 <input type="checkbox"/> Notice of References Cited (PTO-892) | 2 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 4 <input checked="" type="checkbox"/> Interview Summary (PTO-413), Paper No. <u>10/9</u> . |
| 5 <input type="checkbox"/> Information Disclosure Statements (PTO-1449), Paper No. _____. | 6 <input type="checkbox"/> Examiner's Amendment/Comment |
| 7 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9 <input type="checkbox"/> Other |

TERMINAL DISCLAIMER

1. The terminal disclaimer filed on June 27, 2003, has been reviewed and is accepted. The terminal disclaimer has been recorded.

REASONS FOR ALLOWANCE

2. The following is an examiner's statement of reasons for allowance:

With respect to independent claim 1, the prior art does not disclose setting the illumination area in a scanning system of a exposure apparatus to be rectangular and letting a light intensity distribution of the illumination area have a trapezoidal shape so that a middle portion of the distribution exhibits a constant light intensity and the two side portions of the distribution exhibit gradually decreasing light intensity as recited in claim 1.

With respect to independent claim 7, the prior art does not disclose a controller for controlling a pulse light source and a scanning system such that a position of a photosensitive substrate in a first direction at the time when the pulse light performs pulse emission in a first scanning operation with respect to the photosensitive substrate and a mask coincides with that in a second scanning operation as recited in claim 7.

With respect to independent claim 9, the prior art does not disclose an scanning exposure apparatus with a scanning system which includes a mask stage and a substrate stage and a first measuring system for measuring a position of the mask and a second measuring system for measuring a position of the substrate and an adjusting system for moving the mask to decrease a position deviation between the mask and the substrate, independently of scanning of the mask, during the scanning exposure, wherein the adjusting system includes a finely movable stage for relatively moving the mask on the mask stage, a driving member for finely driving the finely movable stage in the direction perpendicular to the optical axis and a controller for controlling the driving member in accordance with signals from the first and second measuring systems as recited in claim 9.

With respect to claim independent 15, Applicant argues that JP-A-63-128713 does not disclose or suggest “a mask driving unit for moving the first mask stage and a plate driving unit for moving said plate stage” used synchronously driving the first mask and the plate stage. The mask and the plate of this reference are moved as a unit by driving the scanning frame 6. The Examiner agrees with Applicant’s reason for allowing claim 15.

With respect to independent claim 23, the prior art does not disclose or suggest a second mask stage for finely moving the mask on a first mask stage in each of translational and rotational directions and an illumination system having a slit shaped distribution and a first driving system for synchronously, relatively driving the plate stage and the first mask stage with a velocity ratio B and a detecting system for detecting a deviation amount from an ideal

Art Unit: 2851

positional relation of the mask and the plate occurring at a term of the scanning exposure and a second driving system for driving the second mask stage to correct the deviation during the scanning exposure when the detected deviation amount is out of a predetermined tolerance as recited in claim 23.

With respect to independent claim 29, Applicant argues that the combination of references does not disclose or suggest, *inter alia*, the claimed “first interferometer system to measure positional information of the mask”, “a second interferometer system to measure positional information of the plate” and “said finely movable stage has a reflection surface, and said first interferometer system measures the positional information of the mask by applying a measuring beam to the reflection surface”. The Examiner agrees with Applicant’s reason for allowing claim 29.

With respect to independent claims 30 and 33, Applicant argues that the combination of references does not disclose or suggest, *inter alia*, “detecting a deviation between an ideal positional relation and an actual positional relation of the mask and the plate at a term of the scanning exposure by using a first measuring system to measure positional information of the mask and a second measuring system to measure positional information of the plate” and “correcting a position of the mask determined by said scanning mechanism so as to decrease said deviation value by using a fine moving mechanism provided on said scanning mechanism at the term of the scanning exposure”. The Examiner agrees with Applicant’s reason for allowing claims 30 and 33.

With respect to independent claims 34 and 35, the prior art does not disclose or suggest a first mask stage for moving the mask in the X direction and a second mask stage for finely moving the mask on the first mask stage in each of translational and rotational directions and first driving means for synchronously driving each of a plate stage and the first mask stage with a predetermined velocity ration in the X direction during the scanning exposure and a second driving means for driving the plate stage and second mask stage to maintain a translational relation of the mask and plate in the Y direction and for driving the second mask stage to maintain a relative rotational relation of the mask and the plate during the scanning exposure.

With respect to independent claim 36, the prior art does not disclose or suggest detecting a positional deviation amount between a mask and a plate at a term of the scanning exposure by using a first interferometer to measure positional information of the mask and a second interferometer to measure positional information of the plate and correcting a position of the mask determined by the scanning mechanism for decreasing the detected deviation using a fine moving mechanism at the term of the scanning exposure.

With respect to independent claims 37 and 97, the prior art does not disclose or suggest a first driving system moving a first object in a first direction, at least a part of the first driving system being on one side of a projection system, a second driving system which moves the first object in a plane parallel to the surface of the first object while the first object is moved by the first driving system, at least a part of the second driving system being on the one side of the

Art Unit: 2851

projection system, and a third driving system which moving the second object in the second direction , at least a part of the third driving system being on the other side of the projection system and where a first object held by a second movable member is moved in the first direction by moving the first movable member using the first driving system, and the first object is moved relative to the first movable member by moving the second movable member using the second driving system.

With respect to independent claim 68, the prior art does not disclose or suggest moving a first object in a first direction using a first driving system and shifting the first object in a plane substantially parallel to a surface of the first object using a second driving system while the first object is moved by the first driving system where the first driving system moves a first movable member, the second driving system shifts a second movable member, which support the first object, and where the first object is moved in the first direction by moving the first movable member using the first driving system and is shifted by shifting the second movable member using the second driving system and moving a second object in the second direction by using a third driving system.

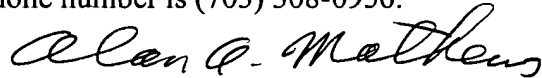
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Art Unit: 2851

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan A. Mathews whose telephone number is (703) 308-1706. The examiner can normally be reached on Monday through Friday from 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on (703) 308-2847. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

A handwritten signature in black ink that reads "Alan A. Mathews". The signature is written in a cursive, flowing style.

Alan A. Mathews
Primary Examiner
Art Unit 2851

AAM